National Institute of Environmental Health Sciences

The use of scenarios as the basis for combined assessment of climate change mitigation and adaptation

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Year: 2011

Journal: Global Environmental Change : Human and Policy Dimensions. 21 (2): 575-591

Abstract:

Scenarios are used to explore the consequences of different adaptation and mitigation strategies under uncertainty. In this paper, two scenarios are used to explore developments with (1) no mitigation leading to an increase of global mean temperature of 4 °C by 2100 and (2) an ambitious mitigation strategy leading to 2 °C increase by 2100. For the second scenario, uncertainties in the climate system imply that a global mean temperature increase of 3 °C or more cannot be ruled out. Our analysis shows that, in many cases, adaptation and mitigation are not trade-offs but supplements. For example, the number of people exposed to increased water resource stress due to climate change can be substantially reduced in the mitigation scenario, but adaptation will still be required for the remaining large numbers of people exposed to increased stress. Another example is sea level rise, for which, from a global and purely monetary perspective, adaptation (up to 2100) seems more effective than mitigation. From the perspective of poorer and small island countries, however, stringent mitigation is necessary to keep risks at manageable levels. For agriculture, only a scenario based on a combination of adaptation and mitigation is able to avoid serious climate change impacts.

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Resource Description

Climate Scenario :

specification of climate scenario (set of assumptions about future states related to climate)

Special Report on Emissions Scenarios (SRES), Other Climate Scenario

Other Climate Scenario: adaptation and mitigation scenarios

Early Warning System:

resource focus on systems used to warn populations of high temperatures, extreme weather, or other elements of climate change to prevent harm to health

A focus of content

Exposure :

weather or climate related pathway by which climate change affects health

Unspecified Exposure

Geographic Feature:

resource focuses on specific type of geography

None or Unspecified

Geographic Location:

resource focuses on specific location

Global or Unspecified

Health Impact:

specification of health effect or disease related to climate change exposure

General Health Impact

Mitigation/Adaptation:

mitigation or adaptation strategy is a focus of resource

Adaptation, Mitigation

Model/Methodology:

type of model used or methodology development is a focus of resource

Cost/Economic, Exposure Change Prediction, Methodology

Population of Concern: A focus of content

Resource Type:

format or standard characteristic of resource

Research Article, Research Article

Resilience:

capacity of an individual, community, or institution to dynamically and effectively respond or adapt to shifting climate impact circumstances while continuing to function

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Socioeconomic Scenario: Other Socioeconomic Scenario

Other Socioeconomic Scenario: adaptation /mitigation scenarios

Timescale:

time period studied

Medium-Term (10-50 years)

Vulnerability/Impact Assessment:

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content